



SNCB gene

synuclein beta

Normal Function

The *SNCB* gene provides instructions for making a protein called beta-synuclein. The exact function of this protein is unknown, but it is likely involved in a process called synaptic plasticity. Synaptic plasticity is the ability of the connections between nerve cells (called synapses) to change and adapt over time in response to experience. This process is critical for learning and memory. Beta-synuclein may also prevent harmful accumulation of a similar protein called alpha-synuclein in nerve cells (neurons).

Health Conditions Related to Genetic Changes

Dementia with Lewy bodies

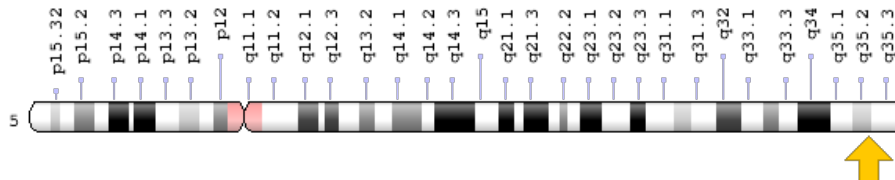
At least two mutations in the *SNCB* gene have been found to cause dementia with Lewy bodies. This condition is characterized by intellectual decline (dementia); visual hallucinations; sudden changes in attention and mood; and movement problems such as rigidity of limbs, tremors, and impaired balance and coordination.

SNCB gene mutations lead to the production of a protein with impaired function. It is thought that this altered protein may not be able to prevent alpha-synuclein accumulation. A decrease in functional beta-synuclein likely results in alpha-synuclein accumulation and the formation of Lewy bodies. These abnormal protein clusters are present throughout the brain, where they impair neuron function and ultimately cause cell death. Over time, the loss of neurons increasingly impairs intellectual and motor function and the regulation of emotions, resulting in the signs and symptoms of dementia with Lewy bodies.

Chromosomal Location

Cytogenetic Location: 5q35.2, which is the long (q) arm of chromosome 5 at position 35.2

Molecular Location: base pairs 176,620,082 to 176,630,561 on chromosome 5 (Homo sapiens Updated Annotation Release 109.20200522, GRCh38.p13) (NCBI)



Credit: Genome Decoration Page/NCBI

Other Names for This Gene

- beta-synuclein

Additional Information & Resources

Educational Resources

- Dementia: A NICE-SCIE Guideline on Supporting People With Dementia and Their Carers in Health and Social Care (2007): Dementia
<https://www.ncbi.nlm.nih.gov/books/NBK55480/>
- Dementia: A NICE-SCIE Guideline on Supporting People With Dementia and Their Carers in Health and Social Care (2007): Diagnosis and Assessment
<https://www.ncbi.nlm.nih.gov/books/NBK55453/#ch6.s32>

Scientific Articles on PubMed

- PubMed
<https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28SNCB%5BTIAB%5D%29+OR+%28synuclein+beta%5BTIAB%5D%29+OR+%28beta+synuclein%5BTIAB%5D%29%29+OR+%28beta-synuclein%5BTIAB%5D%29+AND+%28%28Genes%5BMH%5D%29+OR+%28Genetic+Phenomena%5BMH%5D%29%29+AND+english%5BIa%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D>

Catalog of Genes and Diseases from OMIM

- SYNUCLEIN, BETA
<http://omim.org/entry/602569>

Research Resources

- Atlas of Genetics and Cytogenetics in Oncology and Haematology
http://atlasgeneticsoncology.org/Genes/GC_SNCB.html
- ClinVar
<https://www.ncbi.nlm.nih.gov/clinvar?term=SNCB%5Bgene%5D>
- HGNC Gene Symbol Report
https://www.genenames.org/data/gene-symbol-report/#!/hgnc_id/HGNC:11140
- Monarch Initiative
<https://monarchinitiative.org/gene/NCBIGene:6620>
- NCBI Gene
<https://www.ncbi.nlm.nih.gov/gene/6620>
- UniProt
<https://www.uniprot.org/uniprot/Q16143>

Sources for This Summary

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- Brown JW, Buell AK, Michaels TC, Meisl G, Carozza J, Flagmeier P, Vendruscolo M, Knowles TP, Dobson CM, Galvagnion C. β -Synuclein suppresses both the initiation and amplification steps of α -synuclein aggregation via competitive binding to surfaces. *Sci Rep*. 2016 Nov 3;6:36010. doi: 10.1038/srep36010.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/27808107>
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- Ohtake H, Limprasert P, Fan Y, Onodera O, Kakita A, Takahashi H, Bonner LT, Tsuang DW, Murray IV, Lee VM, Trojanowski JQ, Ishikawa A, Idezuka J, Murata M, Toda T, Bird TD, Leverenz JB, Tsuji S, La Spada AR. Beta-synuclein gene alterations in dementia with Lewy bodies. *Neurology*. 2004 Sep 14;63(5):805-11.
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